

M o n t h l y M a r i n e B i o t o x i n R e p o r t

November 2015

Technical Report No. 15-22

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of November, 2015. Ranges of toxin concentrations are provided for the paralytic shellfish poisoning (PSP) toxins and for domoic acid (DA). Estimates are also provided for the distribution and relative abundance of *Alexandrium*, the dinoflagellate that produces PSP toxins, and *Pseudo-nitzschia*, the diatom that produces domoic acid. Summary information is also provided for any quarantine or health advisory that was in effect during the reporting period.

Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All samples are assayed for PSP toxins; DA analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA); (iv) Please refer to the appropriate figure key for an explanation of the symbols used on the maps.

Southern California Summary:

Paralytic Shellfish Poisoning

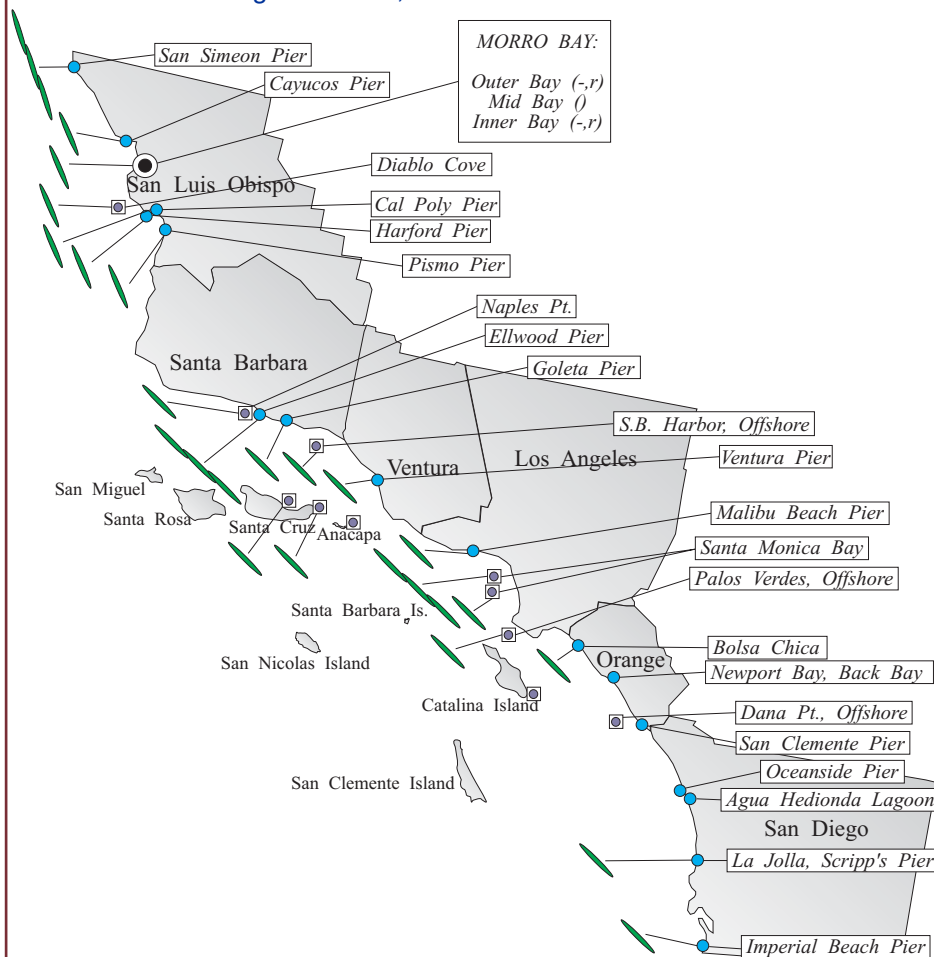
Alexandrium was not observed at any Southern California site in November (Figure 1). PSP toxins were not detected in any bivalve shellfish samples collected in November (Figure 3).

Domoic Acid

Pseudo-nitzschia was observed at sampling

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Figure 1. Distribution of toxin-producing phytoplankton in Southern California during November, 2015.



Relative Abundance of Known Toxin Producers

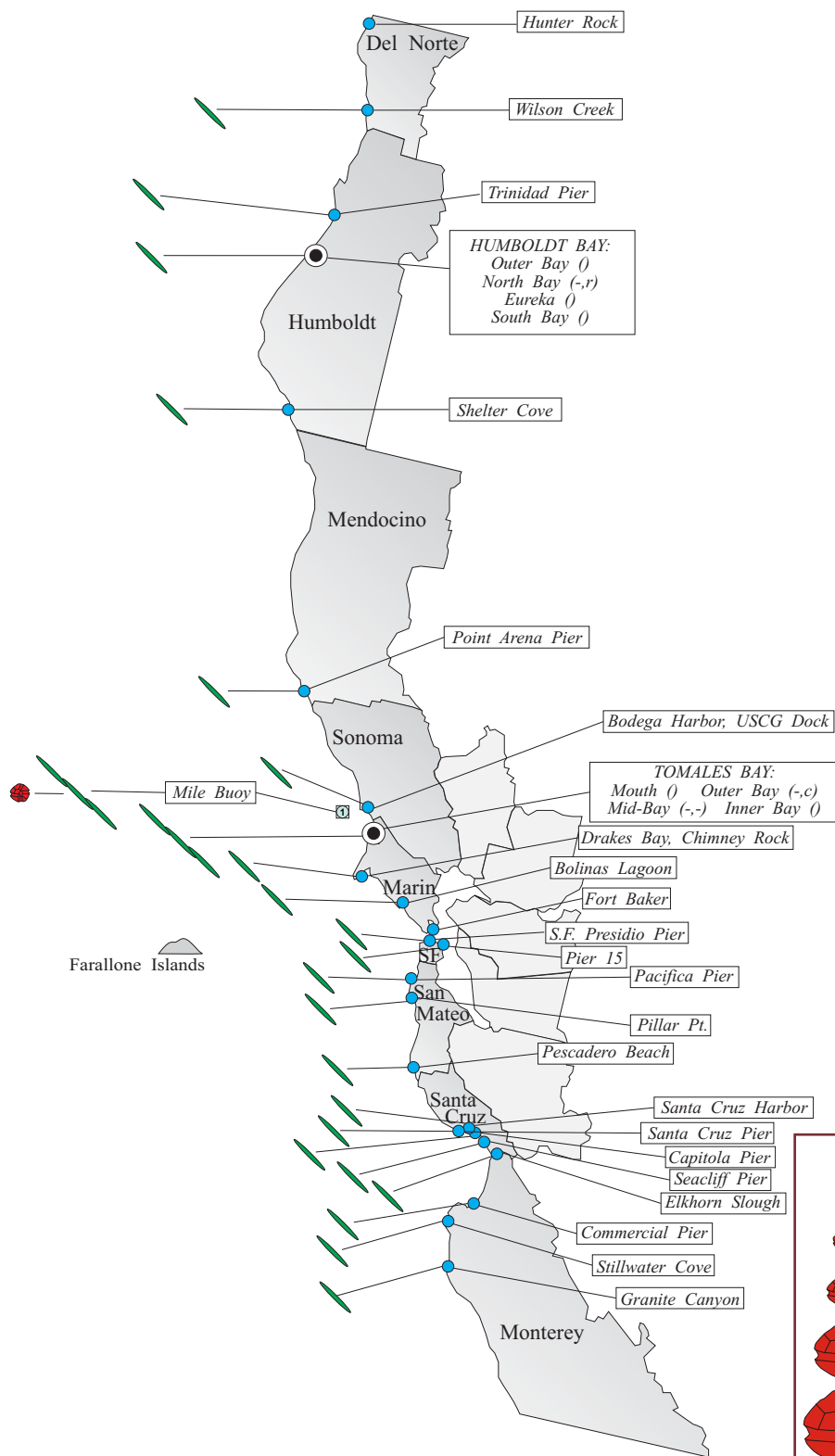
Alexandrium Species		Pseudo-nitzschia Species	
	Rare (less than 1%)		Present (less than 10%)
	Present (between 1% and 10%)		Common (between 10% and 50%)
	Common (between 10% and 50%)		Abundant (greater than 50%)
	Abundant (greater than 50%)		

MONTHLY SAMPLING STATIONS:

For areas with multiple sampling stations, species abundance at each station is represented as follows:
(a,p) = Abundance for *Alexandrium* and *Pseudo-nitzschia*.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

Figure 2. Distribution of toxin-producing phytoplankton in Northern California during November, 2015.



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sites in all Southern California counties (Figure 1). The cell mass was low at all locations. It should be noted that when *Pseudo-nitzschia* was observed to be 'common' it was a nontoxic species in the *delicatissima* complex. Domoic acid was not detected in bivalve shellfish samples analyzed during November (Figure 3). Crab and lobster samples collected by the CDPH Food and Drug Branch in Santa Barbara County continued to exhibit a range of concentrations: <2.5-1000 ppm (rock crab), <2.5-170 ppm (stone crab), and <2.5-110 ppm (spiny lobster). The domoic acid alert level was exceeded in the viscera of five of the 43 rock crab samples, six of 18 stone crab samples, and two of 11 spiny lobster samples. Dungeness crab and rock crab from San Luis Obispo County contained low levels of domoic acid. A spiny lobster sample collected by a volunteer from offshore of Port Hueneme in Ventura County contained a low level of domoic acid in the viscera.

Non-Toxic Species

The diatom *Chaetoceros* was common to abundant at sites in San Luis Obispo to Santa Barbara and Orange to San Diego counties. The dinoflagellate *Ceratium furca* was common at sites in Santa Monica Bay.

Northern California Summary:

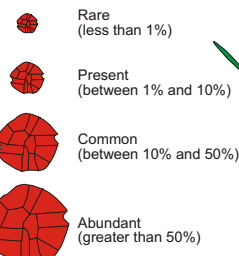
Paralytic Shellfish Poisoning

A low number of *Alexandrium* was observed

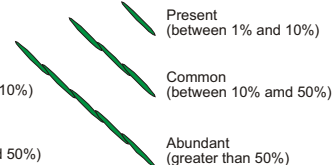
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Relative Abundance of Known Toxin Producers

Alexandrium Species



Pseudo-nitzschia Species



MONTHLY SAMPLING STATIONS:

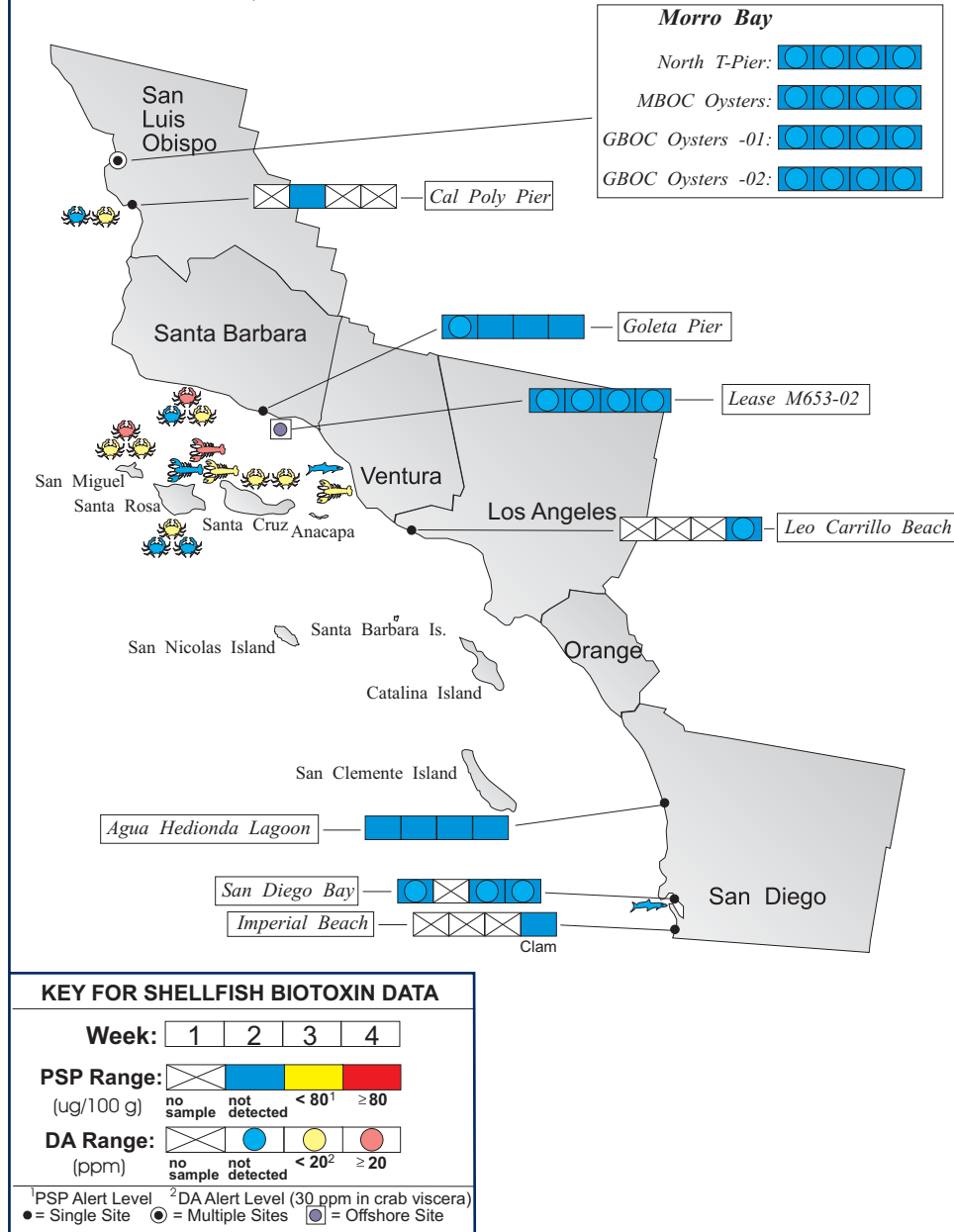
- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

For areas with multiple sampling stations, species abundance at each station is represented as follows:

(A,P) = Abundance for *Alexandrium* and *Pseudo-nitzschia*.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

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Figure 3. Distribution of shellfish biotoxins in Southern California during November, 2015.



at the One Mile Buoy offshore of Sonoma County (Figure 2). PSP toxins were not detected in any bivalve shellfish samples in November (Figure 4).

Domoic Acid

Pseudo-nitzschia was observed at sites between Del Norte and Monterey counties (Figure 2). Cell mass was low at all locations. Domoic acid was not detected in bivalve shellfish samples analyzed during November. The majority of the Dungeness crab samples collected by the Food and Drug Branch exceeded the alert level in the viscera: five of nine from Del Norte County, 17 of 27 from Humboldt County, 10 of 12 from Mendocino County, and 8 of 12 from Sonoma County. Concentrations ranged from <2.5-9 ppm, 13-65 ppm, 20-270 ppm, and 11-91 ppm respectively. In Marin County, four of 12 Dungeness crab samples were over the alert level in the viscera with the highest concentration of 81 ppm. One of the 17 Dungeness crab samples from Monterey County was over the alert level, with a concentration of 83 ppm. Dungeness crabs collected from San Mateo County contained low levels of domoic acid in the viscera.

Non-Toxic Species

The diatom *Chaetoceros* was common to abundant at sites in Marin, Santa Cruz, and Monterey counties. The diatom

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The Marine Biotoxin Monitoring and Control Program, managed by the California Department of Public Health, is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins and domoic acid.

The Phytoplankton Monitoring Program is a state-wide effort designed to detect toxin producing species of phytoplankton in ocean water before they impact the public. The phytoplankton monitoring and observation effort can provide an advanced warning of a potential toxic bloom, allowing us to focus sampling efforts in the affected area before California's valuable shellfish resources or the public health is threatened.

For More Information Please Call:
(510) 412-4635

For Recorded Biotoxin Information Call:
(800) 553-4133

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Thalassiosira was common at the One Mile Buoy in Sonoma County and inside Tomales Bay in Marin County.



QUARANTINES:

The annual mussel quarantine ended at midnight on October 31 for all coastal counties except for Del Norte, Humboldt, Santa Cruz, Monterey, and Santa Barbara counties.

On November 3rd the Department issued a Health Advisory warning consumers not to eat Dungeness and Rock crabs caught in waters between the Oregon border and the southern Santa Barbara County line, due to the detection of dangerous levels of domoic acid.

On November 13th the Department removed the health advisory for recreationally harvested bivalve shellfish and finfish from Santa Cruz, Monterey, and Santa Barbara counties. The Health Advisory for recreationally harvested bivalve shellfish from Humboldt and Del Norte counties was updated to state that the white meat (adductor muscle) of scallops caught in these areas may be consumed; however, the viscera (internal organs) should be discarded.

Consumers of Washington clams, also known as butter clams (*Saxidomus nuttalli*), are cautioned to eat only the white meat. Washington clams can concentrate the PSP toxins in the viscera and in the dark parts of the siphon and can remain toxic for a long period of time. Persons taking scallops or clams, with the exception of razor clams, are advised to remove and discard the dark parts (i.e., the digestive organs or viscera). Razor clams

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Figure 4. Distribution of shellfish biotoxins in Northern California during November, 2015.

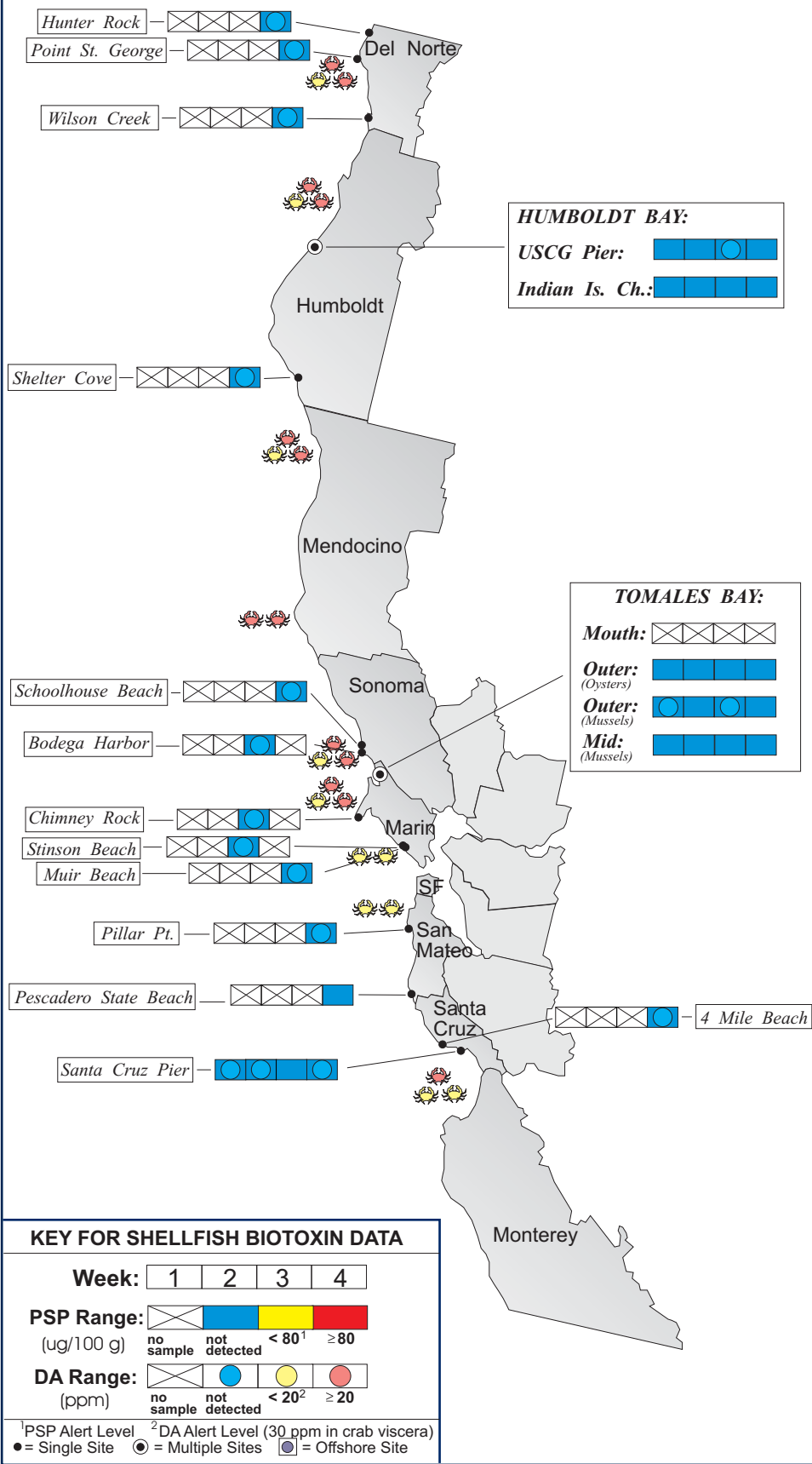


Table 1. Program participants collecting phytoplankton samples during November, 2015.

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AGENCY	#	AGENCY	#
DEL NORTE COUNTY			
Yurok Tribe Environmental Program	1	Tolowa Dee-ni' Nation	1
HUMBOLDT COUNTY		Bureau of Land Management	
Coast Seafood Company	4	Humboldt State University Marine Lab	2
MENDOCINO COUNTY		CDPH Volunteer (<i>Marie DeSantis</i>)	
SONOMA COUNTY			
CDPH Marine Biotoxin Program	1	Bodega Marine Lab & Farallone Institute	2
MARIN COUNTY			
CDPH Marine Biotoxin Program	1	Hog Island Oyster Company	5
CDPH Volunteers (<i>Anderson, Clyde</i>)	5	NatureBridge	1
SAN FRANCISCO COUNTY		CDPH Volunteer (<i>Eugenia McNaughton</i>)	
Monte Vista High School	2	Exploratorium	3
SAN MATEO COUNTY			
San Mateo County Environmental Health Dept.	3	The Marine Mammal Center (<i>Stan Jensen</i>)	5
SANTA CRUZ COUNTY			
U.C. Santa Cruz	4	San Lorenzo Valley High School	3
Santa Cruz County Envir. Health Department	3	The Otter Project (<i>Jeff Palsgaard</i>)	4
MONTEREY COUNTY			
The Otter Project (<i>Rose, Noke</i>)	5	Marine Pollution Studies Laboratory	1
Monterey Abalone Company	3	Friends of the Sea Otter (<i>Janis Chaffin</i>)	1
SAN LUIS OBISPO COUNTY		CDPH Volunteers (<i>Plemons, Hoskins</i>)	
Morro Bay National Estuary Program	2	Morro Bay Oyster Company	5
Coastal Discovery Center, San Simeon	5	Tenera Environmental	2
Friends of the Sea Otter (<i>Kelly Cherry</i>)	4	CDPH Marine Biotoxin Program	1
SANTA BARBARA COUNTY		Island Packers/HABNet	
CDPH Volunteer (<i>Sylvia Short</i>)	2	U.C. Santa Barbara	4
National Park Service	1	Santa Barbara Channel Keeper	4
VENTURA COUNTY			
National Park Service	1	CDPH Volunteer (<i>Fred Burgess</i>)	3
LOS ANGELES COUNTY			
Los Angeles County Sanitation District	3	CDPH Volunteers (<i>Cal Parsons</i>)	1
Los Angeles County Health Department	1	City of Los Angeles Envir Monitoring Division	3
ORANGE COUNTY			
California Department of Fish and Wildlife	4	Amigos de Bolsa Chica	4
Ocean Institute	1	CDPH Volunteer (<i>Truong Nguyen</i>)	4
SAN DIEGO COUNTY			
Scripps Institute of Oceanography	5	Carlsbad Aquafarms, Inc.	1
CDPH Volunteer (<i>Cynthia Hall</i>)	1	Tijuana River National Estuary Research	4

(*Siliqua patula*) are an exception to this general guidance due to their ability to concentrate and retain domoic acid in the edible white meat as well as in the viscera.

PSP toxins can produce a tingling around the mouth and fingertips within a few minutes to a few hours after eating toxic shellfish. These symptoms can be followed by disturbed balance, lack of muscular coordination, slurred speech and difficulty swallowing. In severe poisonings, complete muscular paralysis and death from asphyxiation can occur.

Symptoms of domoic acid poisoning can occur within 30 minutes to 24 hours after eating toxic seafood. In mild cases, symptoms of exposure to this nerve toxin may include vomiting, diarrhea, abdominal cramps, headache and dizziness. These symptoms disappear completely within several days. In severe cases, the victim may experience excessive bronchial secretions, difficulty breathing, confusion, disorientation, cardiovascular instability, seizures, permanent loss of short-term memory, coma and death.

Any person experiencing any of these symptoms should seek immediate medical care. Consumers are also advised that neither cooking or freezing eliminates domoic acid or the PSP toxins from the shellfish tissue. These toxins may also accumulate in the viscera of seafood species such as crab, lobster, and small finfish like sardines and anchovies, therefore these tissues should not be consumed.

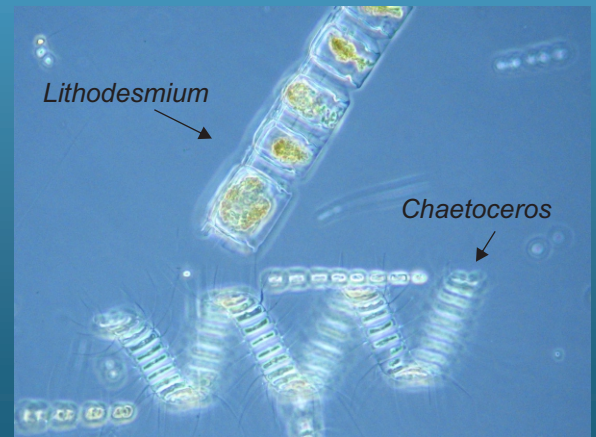
Contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.



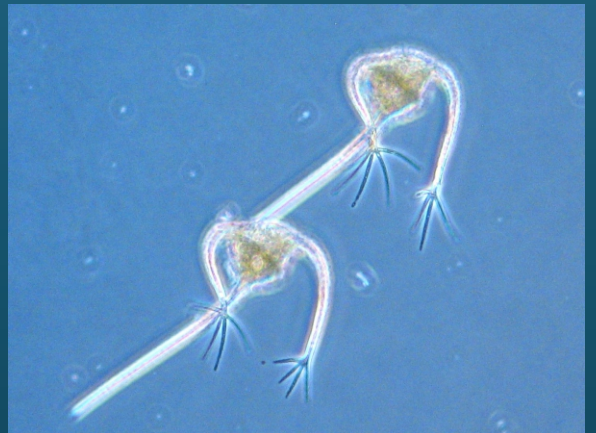
Table 2. CDPH program participants submitting shellfish samples during November, 2015.

COUNTY	AGENCY	#
Del Norte	Tolowa Dee-ni' Nation	1
	Yurok Tribe Environmental Program	2
	CDPH Food and Drug Branch	9
Humboldt	Coast Seafood Company	8
	CDPH Volunteer (Steve Fox)	1
	CDPH Food and Drug Branch	27
Mendocino	CDPH Food and Drug Branch	12
Sonoma	CDPH Marine Biotoxin Program	1
	CDPH Volunteer (Dennis Spike)	1
	CDPH Food and Drug Branch	12
Marin	Cove Mussel Company	5
	Hog Island Oyster Company	11
	CDPH Marine Biotoxin Program	1
	CDPH Volunteers (Rand Dobleman, Jamie Sutton)	2
	CDPH Food and Drug Branch	12
San Francisco	None Submitted	
San Mateo	San Mateo County Environmental Health Department	2
	CDPH Food and Drug Branch	6
Santa Cruz	U.C. Santa Cruz	4
	CDPH Volunteer (Michael Wolcott)	1
Monterey	CDPH Food and Drug Branch	17
San Luis Obispo	Grassy Bar Oyster Company	10
	Morro Bay Oyster Company	9
	CDPH Marine Biotoxin Program	1
	CDPH Food and Drug Branch	25
Santa Barbara	Santa Barbara Mariculture Company	5
	U.C. Santa Barbara	5
	CDPH Food and Drug Branch	72
Ventura	CDPH Volunteer (Bill Weinerth)	1
	U.C. Santa Barbara	1
Los Angeles	CDPH Volunteer (Steven Field)	1
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	4
	CDPH Volunteer (Steve Crooke)	1
	U.S. Navy Marine Mammal Program	4

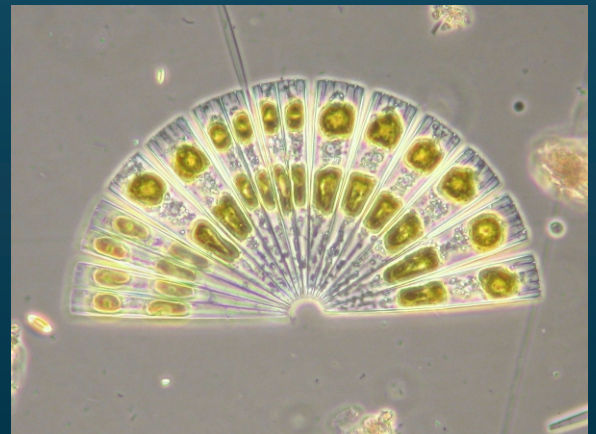
PHYTOPLANKTON GALLERY



A straight chain of the diatom *Lithodesmium* and a spiraling chain of the diatom *Chaetoceros*.



A rare sighting of the dinoflagellate species *Ceratium ranipes* at Goleta Pier in Santa Barabara County in November. The finger appendages are diurnal. They disappear at night and are re-grown during the daylight.



The fan shaped cells of the diatom *Licmophora*.